

ABSTRACT OF THE DISCLOSURE

A low dielectric constant material having a first fluorine concentration in a near-surface portion and a second fluorine concentration in an interior portion provides an insulator suitable for use in integrated circuits. In a further aspect of the present invention, fluorine is depleted from a near-surface portion of a fluorine containing dielectric material by a reducing plasma. Fluorine in fluorinated low-k dielectric materials, such as SiOF, amorphous fluorinated carbon (a-F:C) and parylene-AF4, can react with surrounding materials such as metals and Si₃N₄, causing blisters and delamination. Treatment of these fluorinated low-k dielectric materials in a reducing plasma, which may be produced from precursor gases such as H₂ or NH₃, depletes the surface region of fluorine and hence reduces reaction with surrounding materials and F outgassing. By selecting an appropriate point in the integration flow, specific interfaces which are most susceptible to F-attack can be targeted for depletion.

SCAN 12